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Academic characteristics and academic success patterns of community college transfer students at the University of Massachusetts.

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ACADEMIC CHARACTERISTICS AND ACADEMIC SUCCESS PATTERNS OF COMMUNITY COLLEGE TRANSFER STUDENTS AT THE UNIVERSITY OF MASSACHUSETTS

A Dissertation Presented

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CHAPTER I

INTRODUCTION

If the United States is founded on a basic principle of equal opportunity for all, then it necessarily follows that there should be equal opportunity of education for all. Only until the very recent years has this tenet been anything other than a myth, particularly in reference to post-secondary education. With the recent and phenomenal growth and expansion of the two-year lower division institutions, commonly called junior or community colleges, the opportunity for higher education may not now necessarily be denied to those who could otherwise benefit from that experience. In 1900 there were 232,000 undergraduates enrolled in 238 institutions which represented only 4.01 percent of the 18-21 year old population; in 1954 there were 1,977,000 undergraduates enrolled in 1,863 institutions, representing 29.9 percent of the 18-21 year old population; and in 1963 there were 3,755,515 enrolled in 2,132 institutions, representing 33.75 percent of the 18-21 year old population.[1] In addition to the millions of students who will be enrolled in four-year institutions in 1975, enrollment at the two-year college level will exceed 3,000,000 in the more than 1300 public and independent junior colleges.[2]

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[1]U.S. Department of Health, Education and Welfare, Digest of Educational Statistics 1966, Office of Education, U.S. Govt. Printing Office, Washington D.C. 1966, pp. 67-69.

[2]Edmund J. Gleazer Jr., "Recognizing the Expanding Role of Junior Colleges in Higher Education". Paper delivered at The Colloquium on College Admissions Policies, Interlochen, Michigan, June, 1967.

In addition to the problem of the rising birth rate and a higher percentage of high school graduates seeking higher education, the rising costs and shrinking endowments have forced a high proportion of privately supported colleges into near bankruptcy. This necessarily places an even heavier burden upon the publicly supported colleges and universities, particularly in the years just ahead.

If our public institutions of higher learning are going to meet the needs of our ever changing society, then they must be ready and capable and flexible enough to alter or adjust even their basic philosophical foundations in order to confront the problems of a changing nation and world.

In an effort to provide adequate educational opportunities and experiences to youth, the uniquely American innovation of the junior college system has been developed. This system had its origin in the early years of our present century with the founding of Joliet Junior College in Illinois, in 1901, and has expanded through 1967 to 850 junior colleges enrolling 1.5 million students.

Many of the students entering the junior colleges will seek the one or two year terminal programs which will prepare them to enter the world of work upon completion of their junior college experience. But one of the more prominent roles of the junior college, especially in recent years, has been to offer the first two years of college work, equivalent to the first two years work at a four year college or university. Naturally this has created an opportunity for students

to move from the two-year institutions to the four-year institutions. With this transfer student mobility have come many concerns at both the junior college level and the senior college level. For example, the junior colleges are asking themselves if they are able to offer adequately the equivalent of the first two years of a four year degree program. If this appears to be the case, they then wonder how they are going to be able to become knowledgeable of all the four-year institutions to which their students wish to transfer. Many of the junior colleges are concerned that they may be doing an injustice in trying to meet all the needs of all the people in the community by offering so many various curricula that the academic outcome is mediocrity or less.

Equal concern is evident at the four-year institutions in that acceptance of the junior college transfer student necessarily restricts the number of freshmen that may be enrolled. Some institutions either have or are at least contemplating the dropping of the first two years undergraduate work, and instead are directing their energies toward upper division and graduate level programs. However, many of the four-year institution faculty question the ability of the junior colleges to provide quality education at this lower division level.

These concerns are of even greater moment for Massachusetts because the publicly supported community college is so totally new to this region of the country. The oldest community college in

Massachusetts is only seven years old. As one might expect there has been virtually no systematic research conducted on the transfer students of the Massachusetts community college system; and since the Board of Trustees of the University of Massachusetts has committed the University to accept qualified community college transfers, this investigator felt that more detailed information based upon research about these transfers needed to be determined.

Basically, this study of the academic characteristics and patterns of academic success of community college transfer students is an attempt to supplement information already known from similar studies in other parts of the country. Hopefully, it will establish a basic fund of knowledge about these transfers that will serve as impetus for further detailed study of the many facets of the two-year transfer transition process.

Statement of the Problem

This is a study intended to discover certain academic characteristics and patterns of academic success of community college students who transferred to the University of Massachusetts. Academic characteristics refer to those factors that pertain to academic aptitude as measured by the grade twelve Verbal SAT, Mathematics SAT, and class rank converted score. Patterns of success refer to grade point average by semester and cumulative. In an attempt to delineate the characteristics of the community college student further,

the investigator has categorized the transfer students into four "types." The "types" are restricted by the academic aptitude limits established by the investigator. The four "types" are categorized according to how they would be viewed as freshmen candidates for admission to the University: (1) "plugger-type" of average aptitude but better than average academic achievement; (2) "late-achiever type" of better than average aptitude with average or less academic achievement; (3) the "qualified-type" of above average aptitude and above average academic achievement; and (4) the "unqualified-type" of below average aptitude and below average academic achievement. More directly the purpose of this study is to: (1) compare the academic aptitude as measured by the grade twelve Verbal SAT score, the Mathematics SAT score, and class rank of these students with the academic aptitude of regularly enrolled University of Massachusetts students, who completed all their undergraduate work at the University; (2) compare the academic achievement of these community college transfer students with the academic achievement of the regularly enrolled students at the University of Massachusetts; (3) compare academic aptitude with academic achievement of four specifically defined "types" of community college transfer students; (4) compare the community college academic achievement with the academic achievement that the students attained after matriculation as transfers to the University of Massachusetts.

The following hypotheses have been examined in order to determine the aforementioned statements.

1. The academic aptitude as measured by the grade twelve Verbal SAT, the Mathematics SAT, and class rank for community college transfer students will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen.

2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following grade twelve criteria: Verbal SAT, Mathematics SAT, and class rank.

3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of regularly enrolled University of Massachusetts students.

4. The first-semester-after-transfer grade point average for community college transfers will be lower than the fifth semester grade point average of regularly enrolled University students.

5. The eighth semester grade point average for both groups will be approximately the same.

6. For the "plugger-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

7. For the "late-achiever type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

8. For the "unqualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

9. For the "qualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

Need for the Study

An indication of the newness of the community college system in the Commonwealth of Massachusetts might be best manifested by a review of the state of community college education in Massachusetts by Medsker in 1959. He states that Massachusetts "(1) is a state in a section of the country where the early development of private institutions has set a pattern of higher education now questioned in view of the demands for college opportunity; (2) the size of the state's population and industry has raised the question as to whether existing educational opportunities and services are comparable to those in other states; (3) although a system of public junior colleges was recommended for the state more than thirty years ago with little development in the meantime, a renewed effort has recently been made to determine the possible role of this type of institution."[3]

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[3]Leland L. Medsker, The Junior College: Progress and Prospect, McGraw-Hill Book Co., New York, 1960, p. 234-235.

Medsker also went on to say that despite the good beginning, the budget submitted by the newly established Board of Regional Community Colleges was not passed by the 1959 Legislature. "Thus after a long-delayed but optimistic beginning on an expanded community college program, the future of such a development in Massachusetts is still unknown.[4]

We now know, however, that the program was finally initiated and has expanded to its present status of twelve state-supported community colleges with more in the planning stages.

Here in the northeastern section of the country the community college system is in its infancy and much more needs to be discovered as to its unique characteristics and qualities. New York recently has declared its position concerning education of its youth: The commitment of the State University Trustees in its 1964 revision of the Master Plan[5] has given the specific charge to the two-year community college as follows:

> "The two-year colleges are the very foundation of the University. More and more it is they who are opening the door to higher education, revealing to the youth of the State the scope of the total University and the educational opportunities it offers them. The two year colleges must enable a young adult to measure against the needs of society his ability and willingness to work.
>
> One of the urgent domestic problems facing New York as well as the other states, (Massachusetts), is the plight of the disadvantaged. It is hoped that many of the disadvantaged who undertake programs will eventually be trained as technicians. Others will be encouraged to continue their studies in four-year colleges and graduate schools."

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[4] Ibid, p. 240.

[5] State University of New York, Stature and Excellence: Focus for the Future, "The Master Plan", Revised 1964, New York, 1964, pp. 15-16.

As Knoell and Medsker pointed out in their monumental national study of the transfer student, "Transfer programs now attract the largest proportion of junior college students, particularly among recent high school graduates. There are the high school under-achievers who are taking advantage of one more chance to demonstrate their ability to do satisfactory college work; the late deciders about college attendance who have high school deficiencies; the immature who are emotionally and intellectually unready to enter a four-year college; the insufficiently motivated and the uncertain; and the capable students who lack financial backing for college attendance away from home or who simply want to attend what may be a smaller, less formal college for their first two years."[6]

In their study Knoell and Medsker found that there were vast differences in the success of the transfer students in the forty-three colleges and universities. A student's probability of success after transfer depended heavily upon his choice of four year insitutions in the particular state in which he attended college, in relation to his previous academic record. But they warned against certain pitfalls into which four-year colleges might fall. "A number of the state universities are now facing severe shortages of spaces for new undergraduate students. As this occurs they will be tempted to restrict

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[6]Dorothy M. Knoell and Leland L. Medsker, From Junior to Senior College: A National Study of the Transfer Student, American Council on Education, Washington, D. C., 1965, p.3.

transfer opportunities by abandoning their present open-door policies for junior college students with satisfactory records. The establishment of reasonable standards and policies, and the improvement of counseling in the two and four year colleges with respect to transfer, are clearly a necessity if the states are to make best use of their higher education facilities."[7]

Throughout Knoell's and Medsker's discussion one finds a thread of the continuing need for two and four year institutions to know themselves and each other much more intimately than ever has been true before.

The estimate of the National Commission on Goals[8] that probably half the new college students should be in two-year institutions is somewhat conservative. The diverse needs of up to three-fourths of all high school graduates could be met effectively and economically in comprehensive two-year colleges, close to the students' homes and charging low tuition or none at all.

This whole concept of educational opportunity for all particularly raises the question of selection of transfer students for admission to senior colleges.

A case in point is the present situation in the state of Massachusetts. In an effort to meet its philosophical commitment to the citizens of the Commonwealth, the Board of Trustees has recently

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[7] Ibid., p. 58.

[8] A Report of the President's Commission on National Goals, program for Action in the Sixties, Prentice Hall, Columbia University, 1960, pp. 90-96.

passed a policy statement: "The University of Massachusetts at Amherst is firmly committed to accepting any qualified community college student who has completed the two year transfer program with a satisfactory academic performance and who is recommended by the appropriate officials." This policy places the major portion of the admissions decisions in the hands of the community college personnel who make the recommendations to the University for those students seeking transfer. This policy differs from that of many other four-year institutions, some of which have the open-door policy while others have definitive cut-off limitations such as a 2.75 or a 3.0 on a 4.0 quality point average scale. The present policy at the University has much merit in that it leaves the decision making with the community college personnel who know the student best. By the same token one must subsequently question whether or not the community college personnel or for that fact, University admissions personnel know well enough the characteristics of those community college transfers in order to be reasonably sure in their prognosis of academic success for them. There has been no published research conducted in Massachusetts nor New England since the community college system was established on which to rely concerning the academic characteristics and performance of community college transfer students.

With the ever increasing number of qualified applicants for the relatively limited number of vacancies at the freshman level at the

Amherst campus, approximately 18,400 applications for 3,100 freshman vacancies in 1968, a closer evaluation of the criteria used in predicting success of the transfer student should be made. The number of transfer students admitted necessarily affects the projection of enrollment at all undergraduate levels. Approximately 400 community college transfers were admitted at the Amherst campus in September of 1967. Presently it is projected that the University may enroll as many as 1,500 community college students yearly by 1975. And as Knoell and Medsker cogently pointed out, "Many state universities are admitting transfer students indiscriminately without taking into account the effects of increasing admissions standards for freshmen. Therefore, there is a need for higher admissions standards and better admissions counseling for transfer students."[9] Another important and succinct observation was made by Knoell and Medsker: "Junior colleges do a good job educating their good students but do not concentrate on preparing students with high school deficiencies for four year institutions. Therefore, late bloomers should be further studied and appropriate programs should be undertaken."[10]

The academic performance of junior college transfer students at the senior college level must be determined in order to establish the role and levels of expectancies in the national system of higher education.

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[9] Ibid., p. 58.

[10] Ibid., pp. 92-93.

Limitations of the Study

Any conclusions that can be drawn from the findings of this study are necessarily limited by the following:

1. The transfer students used in this study are restricted to those who were admitted to the University of Massachusetts from eight Massachusetts two-year community colleges in September, 1966.

2. The academic aptitude factors are limited to grade twelve Verbal Scholastic Aptitude Test scores, Mathematics Scholastic Aptitude Test scores, and class rank.

3. The categories of "types" of students are restricted to the limits designated by the investigator.

Definition of Terms

Grade twelve objective admissions criteria: At the University of Massachusetts and most other like institutions the three major objective criteria used in the decision making process include: (1) the College Board Verbal Scholastic Aptitude Tests score; (2) the Mathematics Scholastic Aptitude Test score; and (3) high school class rank. Other factors such as guidance counselor's recommendations, courses of study, patterns of grades, and curriculum or major for which a candidate is applying are also taken into consideration. However, for this study, grade twelve admissions criteria will be limited to the three objective criteria as stated above.

Scholastic Aptitude Test Scores: This is a part of a national testing program conducted by the College Entrance Examination Board whose headquarters are located in Princeton, New Jersey. This

examination is administered nationally five times a year with several test centers in each state. The Scholastic Aptitude Test is a three-hour examination consisting of two parts--the Verbal SAT (V-SAT) and the Mathematics SAT (M-SAT). The Verbal SAT attempts to measure one's ability to deal with verbal concepts and reasoning. The Mathematics SAT attempts to measure one's ability to deal with quantitative concepts and reasoning. Results are reported for each section on a scale ranging from a minimum of two hundred points to a maximum of eight hundred points with a standard deviation of 50.

Class rank: A student's high school class rank is the numerical positioning determined by his academic average in relation to the other members' averages in his graduating class. In this study, it refers to his three-and-one-half year rank (seven semesters) rather than his graduation rank.

Community college transfers: This term refers to those students who matriculate at the University of Massachusetts after completion of one or two years' attendance at one of the state supported community colleges. In this study, there will be students who have come from the following Massachusetts community colleges: Berkshire Community College of Pittsfield, Cape Cod Community College of Hyannis, Greenfield Community College of Greenfield, Holyoke Community College of Holyoke, Massachusetts Bay Community College of Watertown, Mount Wachusett Community College of Gardner, Northern Essex Community College of Haverhill, and Quinsigamond Community College of Worcester.

Regularly enrolled University students: These are students who were admitted and enrolled as freshmen at the University of Massachusetts in September 1964 as freshmen, and who were still enrolled in September 1966 as members of the class of 1968.

Grade point average: (G.P.A.) This refers to the scholastic average attained by college students. It is rated on a four-point scale where the grade of A = 4.0, B = 3.0, C = 2.0, D = 1.0, and F = 0.0.

Categories: Each of the transfers for which there was complete data is placed in one of four categories viewed as if he were applying for admission to the University of Massachusetts as a freshman directly following high school graduation. The criteria used to determine in which category each subject is placed are grade twelve Verbal SAT score, Mathematics SAT score, and class rank. These criteria consist of the three main objective criteria used in making admissions decisions for entering freshmen. The four categories and the limits of the criteria include:

1. qualified - fully qualified for admission with a total of 1000 or more combined score on the SATs and class rank in the top quarter.

2. late achiever - 1000 or higher on SATs but ranks below top quarter.

3. "plugger" - below 1000 on SATs and rank in top third.

4. unqualified - 900 or lower combined SAT score and/or rank in bottom half of class.

Summary

The newness of the community college system in New England and Massachusetts in particular, coupled with the lack of formal research concerning the academic aptitude and academic performance of these community college transfer students has prompted this investigator to seek some of the answers to these questions.

If there are to be increased numbers of these students entering the University causing limited freshman enrollment, then the success or failure patterns of these students should be investigated. The community colleges need feedback from four-year institutions in order to help determine their effectiveness in offering the first two years of a four year undergraduate program.

CHAPTER II

RELATED RESEARCH

Introduction

A review of related literature indicates that there have been interest and concern of the plight of the junior college transfer student who matriculated to a four-year institution. Studies were made as early as the 1920s. Some of the studies were sponsored by institutions of higher learning and some were conducted by interested individuals. These studies are reported in chronological order from 1928 through 1967.

One of the earliest comparisons of achievement of junior college graduates and native students in senior institutions was conducted by Mitchell and Eells.[1] The authors compared the records of all junior college graduates who transferred into Stanford University from autumn 1923 through autumn 1927 with a sampling of native students. The transfer students excelled the native students in grade-point average for each quarter except the first. Forty-three percent of the transfer students went on to graduate schools after completing their bachelors' degree programs, while only twenty-eight percent of the native students did so.

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[1] J. P. Mitchell, and W. C. Eells, "The University Records of Students from Junior Colleges," Stanford University Faculty Bulletin, No. 13, June 30, 1928.

Also in 1928, Showman[2] made a study similar to that of Mitchell and Eells, by comparing junior college transfers to native students at the University of California at Los Angeles. He found that the average grade point ratio for the transfer student (1.79) exceeded that of the native group (1.31) for the first four semesters, but during semesters five through eight, the natives (1.54) exceeded the transfer students (1.32). Honors were awarded to 10.6 percent of the number graduating, but none of the transfer students received honors.

At the University of Arkansas Gerberich and Kerr in 1936 compared 215 junior college transfer students with 436 native students. Junior college transfer students averaged .9 of a grade-point higher than native students in the first two years. In the last two years they averaged .3 of a grade point lower than the native students. Generally, the grades of students who transferred from junior colleges dropped one grade point. They dropped about 1.3 grade points from the fourth semester in junior college to the first semester in senior college. Records of native students improved consistently from the first through the eighth semesters. At the end of the eighth semester, 64.7 percent of the native students

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[2]H. M. Showman, "Junior College Transfers at the University of California at Los Angeles", California Quarterly of Secondary Education, Vol. 4, 1928, pp. 319-322.

[3]J. R. Gerberich and F. L. Kerr, "Success of Transfers at the University of Arkansas", Junior College Journal, Vol. 6, 1936, pp. 180-185.

received baccalaureate degrees, versus 56.3 percent of the transfer students.

Syracuse University, under the direction of Ruth E. Maguire,[4] conducted a study involving 430 junior college transfers who attended Syracuse between 1937 and 1946. Of that number, 62 percent had followed academic curriculums in junior college, while 38 percent pursued terminal or semiprofessional curriculums. She found that 62 percent of these transfers maintained a C+ or higher average at Syracuse. On first entering, however, only 28 percent made a C+. The average scholastic average made by the transfer student was 1.27 (C = 1). The average decrease in grades from junior college was 0.45 to 0.50. Twenty percent had better averages at Syracuse, the averages of 77 percent dropped, and 17 percent were dismissed from the University. Seventy-one percent of the failures entered with averages below 1.50 (C+). Those who transferred after two years were more successful than those who transferred after one year. In general, those in terminal or semiprofessional curiculums in junior college did slightly better at Syracuse than those who were not.

Martorana and Williams[5] made a study which compares junior

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[4]Ruth E. Maguire, "Syracuse University Looks at Its Junior College Transfers", Junior College Journal, Vol. 20, 1949, pp.95-98.

[5]S. V. Martorana and L. L. Williams, "Academic Success of Junior College Transfers at the State College of Washington", Junior College Journal, Vol 24, 1954, pp. 402-415.

college transfer students with native students at the State College of Washington. They found that grade point averages of transfer students were very little different from those of natives except for a drop just after transfer. In some subjects, transfer students were superior to natives, which is surprising since they were inferior to the natives at the high school level. In fact, in light of ability differences in high school, the junior college group did better than might be predicted from high school performance.

In a sister study also conducted at the State College of Washington, Tingey[6] purposed to identify the most prevalent problems confronted by Washington junior college transfer students enrolled in state four-year institutions. He made three major hypotheses:

> 1) Junior college transfers have many problems which non-transfers do not have.
>
> 2) Courses and standards of achievement are not sufficiently coordinated between two and four-year colleges to facilitate an uninterrupted transition.
>
> 3) Transfers do not receive adequate guidance.

Because there was no comparative study made, the first hypothesis could not be substantiated. However, the second and third hypotheses were supported: Little coordination existed between the two types of institutions, and two-thirds of the transfers reported never using counseling facilities.

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[6]D. T. Tingey, "A Study of Guidance Problems of Washington Junior College Students Transferring to the State Four-Year Institutions in Washington," State College of Washington, 1957.

Medsker[7] in 1958 reported on a study involving sixteen four-year colleges in eight states with each state reporting on its junior college transfers. Slightly more than 2500 transfers were included. In general, first semester grades, after transfer, were lower for the transfers, but by graduation they were nearly the same as native grades, and sometimes higher, notably in Kansas and Michigan. Seventy percent of the natively enrolled persisted to graduation within the last two years. Medsker's data included no institution in which academic aptitude for natively enrolled and transfers was controlled.

Milholland[8] inquired into the variables which seem to have a bearing on how well transfer students do in their receiving institutions. Three variables are the sending and receiving institutions and the student's eligibility to enter the receiving institution after high school graduation.

It was found in the Universities of California and Michigan that students eligible after high school do better after transfer from junior colleges than other transfer students and that they also did better in junior college. He concluded that "late bloomers" are relatively rare, and the best predictor of academic performance is past academic performance.

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[7]Leland Medsker, "Cooperative Action Among Two-Year and Four-Year Colleges: Opportunity and Obstacles", Educational Record, Vol. 39, 1958, pp. 114-128.

[8]J. E. Milholland, "Academic Performance of Transfer Student", University of Michigan Official Publication, Ann Arbor: University of Michigan, 1958, Vol. 59, No. 95, pp. 7-14.

The academic records of transfer students at the University of Michigan were examined, and 45 percent of them came from Michigan community colleges. In 1951 and 1952, thirty-six percent of the junior college transfer students failed to make a "C" average, and nineteen percent were dropped. Twenty-five percent of the freshmen made less than a "C" average, and ten percent were dismissed. The highest quarter of community college transfer students did good work; the lowest quarter generally did not. The grade-point averages of community college transfers dropped about .5 of a point to .2 below the average of native students.

At Fresno State College, Wolfson[9] compared 171 native students in their junior and senior years with 116 junior college transfers. The junior college transfers academically performed only slightly less well than the native students by approximately 0.2 of a grade point until the last semester of the senior year when the difference was reduced to 0.1. The grade point average based on a 3.0 scale for the first semester of the junior year for the transfers was 1.40 while that of native students was 1.63. An interesting variance of Wolfson's study with findings of studies such as those by Eells, Showman, and Gerberich and Kerr, showed further decline in the academic performance of the transfers who obtained a mean second semester average of 1.33 compared with 1.71 for the native students. Wolfson felt that

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[9]Leland Medsker, The Junior College Progress and Prospect (New York: McGraw-Hill Book Co., 1960) citing Leo Wolfson, Fresno State College, pp. 121-122, 323.

this uniqueness could be explained only after individual detailed case studies could be made. However, the first semester of the senior year found the junior college transfers decreasing the difference between the two groups by attaining a 1.50 mean average while the natives remained at a 1.71 level. By the last semester of the senior year the transfer average had risen to 1.71 while the native students attained a 1.81. The study further pointed out that only 39 percent of the transfers received degrees by the end of the fourth semester of attendance following transfer as compared with 77 percent of the native students in attendance during the last four semesters who graduated. However, 15 percent of the transfers received degrees after the fourth semester compared with 7 percent of the natives persisting to a degree after the last four semesters. This makes a composite of 84 percent of native students receiving a degree as compared with 54 percent for the junior college transfers.

At the University of Southern California (in 1953), Hyink[10] made a study of 495 native students and 321 junior college transfer students. The median grade point averages for the last four semesters respectively for the native students were 2.43, 2.53, 2.54, 2.57, while the transfer students attained median grade point averages of 2.27, 2.40, 2.50, and 2.55. In relation to grade point average by time of

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[10]Leland Medsker, The Junior College Progress and Prospect, (New York: McGraw-Hill Book Co., 1960) citing Bernard L. Hyink, University of Southern California, pp. 124-25, 331.

graduation, the four year native students excelled the junior college transfer students only by .02.

Young[11] at the University of Illinois investigated the persistence and performance of 168 junior college transfer students and 1,040 native students, all of whom entered the junior year in the fall of 1952 with at least 60 semester hours of credit. This study revealed that the four year native students by the end of the senior year excelled the junior college transfer students by only .14 in terms of grade point average. However, of those who progressed in the normal eight semester sequence, the native students graduated 61 percent while the transfers graduated 40 percent. Nineteen percent of the native students graduated beyond the normal eight semesters; and 14 percent of the transfers graduated beyond the normal eight semesters totaling 80 percent of persistence to graduation for the natives and 54 percent for the transfers.

Probably the most intensive study to date concerning the junior college transfer student is that one conducted by Knoell and Medsker[12] in the early 1960's. They addressed themselves not only to the prediction of success of students after transfer, but also to the

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[11]Leland Medsker, The Junior College Progress and Prospect, (New York: McGraw-Hill Book Co., 1960) citing Raymond J. Young, University of Illinois, pp. 125-126, 333.

[12]Dorothy M. Knoell and Leland L. Medsker, From Junior to Senior College: Center for the Study of Higher Education, University of California, Berkeley, American Council on Education, Washington, D. C., 1965.

counseling, admission, academic placement, and articulation and coordination between institutions.

"The primary goal of the transfer study was to obtain facts, figures, and opinions leading to a fairly comprehensive evaluation of the junior college function as it was being performed in the early 1960's."[13]

The immediate objectives of the study were:

1. To find out what junior college students are like - for example, their personal and family characteristics, economic resources, age, interests, abilities, and experiences- and to learn how these students made their educational plans and decisions.

2. To learn as much as possible about their performance in junior college and after transfer - their grades, patterns of attendance, academic penalties and awards, and, most important of all, what their degree status was at the beginning of the fourth year after transfer, i.e., graduated, still enrolled at the undergraduate level, or dropped out.

3. To compare them with "native" students - those who took all their work at a single four-year institution - using measures of their personal characteristics, academic ability, the grades they earned at different levels, and their patterns of progress through college.

4. To find out which characteristics, traits, and achievements are linked to success after transfer, in terms of the students' earning good grades, persisting in their programs, and graduating on time.

5. To learn whether transfer students are equally successful in all types of four-year colleges and in all states, if not, why not.

6. To gain a better understanding of attrition among transfer students - the distinctive characteristics of students who

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[13] Ibid., p. 4.

drop out, the circumstances under which they do so, and what happens to them afterward.

7. To find out what kinds of admission requirements, credit evaluations, retention policies, and graduation requirements were in effect in the various four-year colleges both in 1960 and in 1964, and to estimate changes and trends which might affect the future mobility of transfer students.

8. To analyze the ways in which the two- and four-year colleges have been working together on transfer problems, both in voluntary articulation arrangements and in the newer, more formal coordinating agencies.[14]

The core group on which the study was focused included 7,243 junior college students who transferred in 1960 to forty-three four-year colleges and universities in ten states.

The two major sources of data which were used in analyses were college transcripts and answers to a biographical 99 question questionnaire. A summary of their major findings can be categorized into five areas: student characteristics, academic characteristics, institutional and state differences, policies and practices, and articulation and coordination.

Student Characteristics

The transfer students were mostly white, Protestant, of native-born parentage, and under twenty-one years of age when they entered the senior institutions. There were many more men than women in the transfer group. The high school record of the men was not as good as that of the women. However, a majority of both groups took a general or college preparatory program in high school and graduated in the upper half of their class.

The transfer students tended to give somewhat negative reasons for choosing a junior college, but they gave high ratings

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[14] Ibid., p. 5.

to the quality of the education they had received. They praised both their junior college instructors and the scope of the curricular offerings. Junior college counseling and advising received higher ratings than did similar services offered by the four-year institutions, but the ratings were less favorable than those given to the various facets of instruction. On the whole, the transfer students were very well satisfied with their experience in junior college and encountered few serious problems in the four-year institutions.[15]

Academic Characteristics

Sixty-two percent of the junior college students were granted their baccalaureate degrees within three years after transfer and 9 percent were still enrolled at the beginning of the fourth year. It is estimated that at least 75 percent of the group will receive their degrees eventually, including some dropouts who transferred to other institutions and others who planned to re-enter the same institution. While the eventual graduation rate will apparently be good, fewer than half the students graduated on time, i.e., at the end of two-plus-two or one-plus-three year programs. The record of the students who transferred with junior standing was much better than that of students who transferred with lower class standing, in terms of both persistence and on-time completion of program.

Most junior college students experienced some drop in grades when they transferred particularly in their first term. The first-term differential was only -0.3 for the entire group, but there was a wide range of differentials among the various two- and four-year colleges. The performance of the dropouts was clearly inferior to that of the graduates, both in junior college and after transfer. Both groups sustained some drop in grades immediately after transfer, but the latter group showed steady improvement in the grades they earned in subsequent terms.

Test results showed that although there was considerable overlap in the test scores of the native and transfer students, the graduates who began their work in a university as freshmen tended to have more academic aptitude and a greater readiness to undertake college work than those who entered a two-year college. At many universities the native student group also earned higher grade point averages in the upper division than their classmates who were transfer students. The grades of the native students

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[15] Ibid., pp. 18-19.

were found to improve steadily as they progressed through their degree programs. Although the junior college grades of the transfer students were higher than the freshman and sophomore grades of the natives, the junior college students experienced a drop in grades after transfer which placed them at a disadvantage in the upper division. The pattern of native-transfer differences was less likely to occur in the teachers colleges than in the major state universities.

The junior college student most likely to succeed in a four-year institution was found to be one who performed well both in high school and in junior college. Junior college grades were more highly related to performance after transfer than was high school performance. However, a poor high school record, e.g., rank in the lowest quintile of the graduating class, often forbode academic difficulty after transfer unless the junior college record was considerably above average.

Financial problems were mentioned by a larger percentage of the students who withdrew voluntarily, motivational problems by a larger percentage of the dismissed students. Some of the motivational problems were apparently present when the students graduated from high school, including a lack of clearly defined interests, values, career plans, and, most important of all, a realistic self-image.[16]

Institutional and State Differences

A student's probability of success after transfer depended heavily upon his choice of four-year institution in the particular state in which he attended junior college, in relation to his previous academic record. Students whose junior college average was below 2.5 (C+) were somewhat unlikely to earn satisfactory grades in many of the major state universities. Students with minimally satisfactory grades in junior college were more likely to be successful in colleges which placed major emphasis on the preparation of teachers than in other types of institutions. However, there was wide variation in the findings for individual institutions and in the factors which produced institutional differences. A few of the factors were found to be the quality of the native students with whom the transfer students competed for grades, the size and complexity of the institution, and the institution's philosophy concerning undergraduate instruction and advisement.[17]

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[16] Ibid., pp. 19-21.

[17] Ibid., p. 22.

Policies and Practices

Most students with at least a "C" average in their junior college program had a fairly wide range of four-year institutions to which they could transfer in 1960. By 1964 the open door to transfer admission had closed only slightly as a result of increased selectivity at the freshman level and limitations on enrollment in the preferred institutions. However, the prevailing philosophy continued to be one which advocated freedom for junior college students with a "C" average to transfer to the institution of their choice. At the same time, there had developed a greatly increased emphasis on guidance. There was also an increase in the testing of transfer students by 1964, but the expectation was that the scores would be used in advising students, rather than in denying admission to those with satisfactory junior college records.[18]

Articulation and Coordination

The area in which the most significant changes occurred during the course of the study was that of articulation and coordination among the two- and four-year colleges. At the start of the study it was primarily the major state universities which were attempting to work with the junior colleges. Other four-year institutions limited their attention to high school relations. Formal coordination was also rather new at that time, at least as it is presently conceived. But by 1964 articulation had become the concern of all institutions which admitted sizeable numbers of transfer students. At the same time, in state after state, mechanisms for formal coordination among institutions were being built into master plans for higher education. Impetus for both articulation and coordination came from the increased demands for higher education, the expected bulge in college-age youth in the mid-1960s, and the financial problems faced by the various states in attempting to afford adequate educational opportunity for all beyond the high school.[19]

In many of the earlier studies such as those by Mitchell and Eels, Showman, and Gerberick and Kerr, only a simple comparison of academic performance was made between junior college transfers and

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[18] Ibid., p. 22.

[19] Ibid., p. 23.

regularly enrolled students. No attempt was made to correlate other variables such as academic aptitude or previous junior college attended with the academic performance.

Ruth Maguire's study at Syracuse in 1949 controlled more variables such as curriculum in which the student was enrolled, number of years in attendance at the junior college, but once again ability levels and high school data were omitted.

In Knoell and Medsker's study of the junior college transfer student of the early 1960's, the data of enrollment was allowed to vary considerably so that the time factor toward graduation was not controlled. This naturally caused inconsistancies in control of the ability factors used since the date of the testing and the actual testing programs differed from state to state.

The study conducted by this investigator builds on the conclusions reached in many of the earlier studies such as those conducted by Mitchell and Eels, Showman, and Gerberich and Kerr who concentrated on grade point average comparisons, by adding factors of academic aptitude, delineation of the transfer students into sub-divisions or categories, and individual community colleges attended. This study also supplements the more comprehensive studies such as Knoell and Medsker's by holding constant such variables as academic aptitude and high school achievement.

It is hoped that the results of this study will add new dimensions to the data that has already been compiled so that even a broader

and more complete understanding of the junior college transfer process can be made known.

CHAPTER III

PROCEDURES USED IN CONDUCTING THE STUDY

In this chapter the following topics were included: (1) General methodology; (2) Population characteristics; (3) Collection of data; and (4) Method of analyzing the data.

General Methodology

In this study of academic aptitude and academic performance of community college transfers to the University of Massachusetts, all 239 community college transfers who were admitted to the University in September of 1966 were selected as the study group. The comparison group was comprised of 348 regularly enrolled University students who entered as freshmen in September 1964 into the class of 1968 and who were still in attendance as juniors in 1966.

The collection of data was the next consideration. The criteria selected for this purpose consisted of grade twelve Verbal Scholastic Aptitude Test score, Mathematics Scholastic Aptitude Test score, and converted high school class rank, along with grade point average by semester and cumulative for the total eight semesters of college work. The data collected for the community college group prior to their enrollment at the University were taken from their admission folders. Data after transfer and data for the University group were taken from the permanent record folders stored in the University Registrar's office.

The final task was the testing of the nine hypotheses stated in Chapter I. Four techniques were used in analyzing the data: (1) Analysis of variance for unequal sized groups; (2) Analysis of variance, multiple classification; (3) t test of significance of the differences among means; (4) Regression.

Population Characteristics

The following information was examined, keypunched and printed out in order to have an over-view of certain characteristics of the community college transfer students being studied.

Selection of the Population. The total population of community college transfers consisted of the 239 students who were admitted in September of 1966. Data in Table I show the number of students representing each of the community colleges and the breakdown of their classification as to sophomore or junior class standing. These students came from the eight state-supported community colleges in existence at that time. This group was selected because it was: (1) the largest group of community college students ever to enter the University at one time; (2) the investigator wished to follow them through for two years; and (3) data was readily available in their admissions folders. It was felt that this group was the most representative to date of community college transfer students in the Commonwealth of Massachusetts.

The University of Massachusetts regularly enrolled comparison

TABLE I

NUMBER OF STUDENTS REPRESENTING
EACH COMMUNITY COLLEGE
N = 239

Community College (coded)	Number of Transfer Students		
	Sophomores	Juniors	Total
# 1	10	41	51
# 2	4	15	19
# 3	3	16	19
# 4	12	32	44
# 5	9	42	51
# 6	1	10	11
# 7	6	17	23
# 8	4	17	21
	49	190	239

sample group consisted of 348 students of the original 2592 who were enrolled as freshmen in the class of 1968 in September of 1964. Only those students of the original freshman class who were still in good standing as juniors in September of 1966 were used, with each fifth name on that roster as the criterion for selection to the 348 sample group.

Collection of Data

Criteria of Academic Aptitude. The grade twelve College Entrance Examination Board Verbal Scholastic Aptitude Test (V-SAT), the Mathematics Scholastic Aptitude Test (M-SAT), and class rank were chosen as indices of college academic aptitude because these are the three main objective criteria used in admissions decisions. In order to include the high school class rank and the Scholastic Aptitude Test scores in the same form and to provide an adjustment for various sized classes, an inverted percentile rank was converted to a standard score scale:

$$\frac{\text{Rank in class} - 0.5}{\text{size of class}} = \text{Inverted Percentile Rank}$$[1]

The Inverted Percentile Rank is converted to a scale having a mean of 50 and a standard deviation of 10. Fractional ranks, such as "second quarter" are calculated at the bottom of the stipulated

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[1]William Starkweather, Electronic Data Processing of Admissions, Office of Institutional Studies, University of Massachusetts, Amherst, Mass., 1963.

quarter; the second ½ of 100 would, therefore, be calculated as 50/100. There are other things that are considered in the admissions process, such as guidance counselors' recommendations and admissions officers' knowledge of Massachusetts high schools, but only the objective data stated above will be treated in this study. In the case of students for whom there was only partial data, these students were not included in the analyses computations.

Grade point average (GPA) based on a scale where 4.0 = A and D = 1.0 was used as representation of academic performance at the college level. The grade point average for community college experience was provided on official transcripts from the Registrars of the various community colleges. The grade point average for performance at the University of Massachusetts was obtained from the permanent record folders in the Univeristy Registrar's office. Permission from the Dean of Admission and Records was granted to the investigator for the purposes of this study.

Supplementary information was recorded for the community college group as factors of interest to the investigator but not for the purpose of statistical application to the study. This consisted of: (1) post-high school experience prior to enrollment at a community college. Categories under this heading included marriage, work, service experience, attendance at another college, or matriculation to community college directly after graduation from high school; (2) name of community college; (3) number of transfer credits granted;

(4) curriculum pursued at the community college; (5) selection of subject matter major at the University of Massachusetts; (6) date and reason for withdrawal from the University, if the student did withdraw; (7) sex; and (8) age.

All the data collected was keypunched on International Business Machine cards. A print out of the data formed the main data bank for quick and easy reference while the data deck of cards was used for the computations in the analysis of data.

Method of Analyzing the Data

All of the computations were made at the University Computer Center. Three basic analyses were employed: (1) analysis of variance; (2) *t* test of significance of differences among means; and (3) multiple regression.

As attested by Wert, Neidt, and Ahmann, "The analysis of variance has been designed to provide an efficient test of the significance of the differences between two or more groups simultaneously."[2] The .05 level of confidence will be used to determine if the F ratio of the mean differences will be significant.

In reference to the use of multiple regression in another phase of analysis, Wert, Neidt, and Ahmann state: "Research workers in the

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[2]James E. Wert, Charles O. Neidt, and J. Stanley Ahmann, Statistical Methods in Educational and Psychological Research, Appleton-Century-Crofts, Inc. New York, 1954, p. 172.

social sciences frequently meet problems in which it is desirable to predict one characteristic of individuals from one or more other characteristics. If a relationship does exist between the characteristics, values in one distribution may be predicted from known values in the other distribution within the limits of the available data."[3] In the multiple regression analyses correlations coefficients at the .05 level will be used to test the significance of mean difference between the variables and the criterion.

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[3] Ibid., p. 226.

C H A P T E R I V

ANALYSIS OF THE DATA

The purpose of this chapter is to: (1) compare the academic aptitude as measured by grade twelve Verbal SAT score, Mathematics SAT score, and converted class rank score of community college transfers, with the academic aptitude of regularly enrolled University of Massachusetts students who completed all their undergraduate study at the University; (2) compare the differences of academic aptitude among the individual community colleges as represented by their respective students; (3) compare the academic achievement as measured by grade point average of these community college transfer students with the academic achievement of regularly enrolled University students; (4) compare for each of the previously defined types of community college transfer student their academic aptitude with their academic achievement; (5) compare for each of the previously defined types of community college transfers their academic achievement obtained at the community college with their academic achievement subsequently obtained at the University.

The results of the analyses are given in the order of the hypotheses as stated in Chapter I:

> 1. The academic aptitude as measured by the grade twelve Verbal SAT, the Mathematics SAT, and class rank for community college transfer students will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen.

2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following grade twleve criteria: Verbal SAT, Mathematics SAT, and class rank.

3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of regularly enrolled University of Massachusetts students.

4. The first-semester-after transfer grade point average for community college transfers will be lower than the fifth semester grade point average of regularly enrolled University students.

5. The eighth semester grade point average for both groups will be approximately the same.

6. For the "plugger-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

7. For the "late-achiever type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

8. For the "unqualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

9. For the "qualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

The data and their analyses are divided into four sections. The first section is concerned with the comparison of academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of the community college transfers with the regularly enrolled University students. Also included in this section is a comparison among the eight community colleges of the academic aptitude of their respective students. The analyses of the first three hypotheses will be treated sequentially in this section.

Section two is concerned with the comparison of academic achievement between community college transfers and regularly enrolled University students. The analyses of hypotheses four and five will be included in this section.

Section three is concerned with the four previously mentioned types of community college transfers. A comparison is made of their academic aptitude and their academic achievement at the community colleges with their subsequent academic achievement at the University. The analyses of hypotheses six, seven, eight, nine, and ten are included in this section.

Section four consists of a discussion of the implications of the findings of these analyses.

Section I

This section is concerned with the comparison of academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT,

and class rank between community college transfer students and regularly enrolled University of Massachusetts students who completed all eight semesters of undergraduate study at the University. In addition the difference in academic aptitude of the transfer students by individual community college is compared with the academic aptitude of the regularly enrolled University students.

These data and their critical analyses are presented in order to test the following hypotheses:

Hypothesis I. The academic aptitude as measured by the grade twelve Verbal SAT, the Mathematics SAT, and class rank for community college transfer students will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen.

In order to determine if a difference in academic aptitude between the two groups existed, an analysis of variances was conducted for each of the three stated criteria of Verbal SAT, Mathematics SAT, and class rank.

Data in Table II, (see page 43), indicate that for the Verbal SAT an F ratio was obtained of 116.495 with 539 degrees of freedom. According to Snedecor's[1] tables of F ratio values, the F ratio of 116.495 is significant at the .01 level of confidence. This indicated a difference in Verbal SAT scores between the community college group and the regularly enrolled University group.

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[1]George W. Snedecor, Statistical Methods, The Iowa State College Press, Ames, Iowa, 1946, p. 225.

TABLE II

ANALYSIS OF VARIANCE OF VERBAL SAT BETWEEN 215 COMMUNITY COLLEGE TRANSFERS AND 325 REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	686572.978	1	686572.978	116.497**
Within groups	3170747.352	538	5893.582	
Total	3857320.330	539		

**F is significant at .01 level of confidence.

As shown by the data in Table III, (see page 45), the mean Verbal SAT for the 215 community college transfers was 481.20 with an 84.06 standard deviation while the mean Verbal SAT for the regularly enrolled University students was 554.04 with a 71.54 standard deviation. The discrepancy in the standard deviations of the two groups indicates that these two groups differ considerably in Verbal SAT mean scores with the community college group scoring lower than the University group.

Concerning the Mathematics SAT scores of the two groups, data in Table IV, (see page 46), indicate that an F ratio was obtained of 174.732 with 539 degrees of freedom. Snedecor's tables of F ratio values shows the F ratio to be significant at the .01 level of confidence. This indicates that there is a difference in Mathematics aptitude as measured by the Mathematics SAT score between the two groups.

Data in Table V, (see page 47), show the Mathematics SAT mean score for the community college group to be 497.68 with a standard deviation of 88.26 while the University group had a Mathematics SAT mean of 591.81 with a standard deviation of 75.83. The rather wide discrepancy in means of the two groups indicates that there is a distinct difference in mathematics aptitude between the two groups measured, with the community college group scoring lower than the University group.

From data in Table VI, (see page 48), it can be seen that there

TABLE III

VERBAL SAT MEANS
TOTAL POPULATION

N = 540

Group	N	Mean	Standard Deviation
Community College	215	481.20	84.06
University of Massachusetts	325	554.04	71.54

TABLE IV

ANALYSIS OF VARIANCE OF MATHEMATICS SAT BETWEEN 215 COMMUNITY COLLEGE TRANSFERS AND 325 REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	1146530.636	1	1146530.636	174.732**
Within groups	3530153.027	538	6561.622	
Total	4676683.664	539		

**F is significant at .01 level of confidence.

TABLE V

MATHEMATICS SAT MEANS
TOTAL POPULATION

N = 540

Group	N	Mean	Standard Deviation
Community College	215	497.68	88.26
University of Massachusetts	325	591.81	75.83

TABLE VI

ANALYSIS OF VARIANCE OF CLASS RANK BETWEEN 215 COMMUNITY COLLEGE TRANSFERS AND 325 REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between groups	9554.049	1	9554.049	201.930**
Within groups	25454.726	538	47.313	
Total	35008.775	539		

**F is significant at the .01 level of confidence.

is a significant difference in class rank converted scores between the community college group and the regularly enrolled University group. It was found that the F-ratio of 201.930 with 539 degrees of freedom was significant at the .01 level of confidence. Data in Table VII, (see page 50), show the mean class rank converted score to be 52.349 (56%ile) with a standard deviation of 6.765 for the community college group, and 60.942 (85%ile) with a standard deviation of 6.953 for the University group. This indicates that the community college group scored significantly lower on the converted class rank variable than did the University group.

In view of the findings of significance of the analyses of variances of the Verbal SAT, Mathematics SAT, and class rank between the community college group and the regularly enrolled University group, the investigator was led to accept hypothesis number one.

Hypothesis 2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following grade twelve criteria: Verbal SAT, Mathematics SAT, and class rank.

In order to determine if a difference existed between the individual community colleges as pertains to the academic aptitude of their students, an analysis of variance was conducted for each of the three aptitude variables: Verbal SAT score, Mathematics SAT score, and converted class rank score. Data in Table VIII, (see page 51), indicate that for the Verbal SAT an F-ratio was found of 1.610 with 214

TABLE VII

HIGH SCHOOL CLASS RANK MEANS
TOTAL POPULATION

N = 540

Group	N	Mean (converted score)	Standard Deviation
Community College	215	52.349 (56 %ile)	6.765
University of Massachusetts	325	60.942 (85 %ile)	6.953

TABLE VIII

ANALYSIS OF VARIANCE OF VERBAL SAT BETWEEN THE EIGHT INDIVIDUAL COMMUNITY COLLEGES AS REPRESENTED BY THEIR STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	78124.958	7	11160.708	1.610
Within groups	1434182.836	207	6928.419	
Total	1512307.794	214		

F is not significant at the .05 level of confidence.

degrees of freedom. This F-ratio is not significant. This indicates that there is no significant difference in the Verbal SAT scores among the eight individual community colleges. Data in Table IX, (see page 53), show the mean and standard deviations of the Verbal SAT by individual community college. The means ranged from a low of 436.91 for community college 3 to a high of 509.83 for community college 2, but the high standard deviation for college 3 explains this variation. From this computation came two homogeneous subsets with all community colleges accounted for in one or both of the homogeneous groups. The results of this analysis show that there is no significant difference between the individual community colleges in terms of the Verbal SAT.

An analysis of variance was conducted for the Mathematics SAT and as the data show on Table X, (see page 54), an F-ratio was found of 0.2223 with 214 degrees of freedom, and this F-ratio is not significant at the .05 level. Table XI, (see page 55), shows the means and standard deviations of the Mathematics SAT by individual community college. The means ranged from a low of 472.91 for college 3 to a high of 510.44 for college 6. Only one homogeneous subset resulted in which each community college was represented. The results of this analysis indicate that there is no significant difference between individual community colleges in terms of the Mathematics SAT.

TABLE IX

VERBAL SAT MEANS BY COMMUNITY COLLEGE
TOTAL POPULATION

N = 215

Community College	Mean	Standard Deviation	Number	Rank of Mean
1	482.04	77.8920	49	4
2	509.83	95.4163	18	8
3	436.91	130.0749	11	1
4	492.79	71.8772	39	6
5	478.72	85.8458	47	3
6	482.56	52.9649	9	5
7	443.62	91.7537	21	2
8	498.87	68.1383	21	7

There were 2 homogeneous subsets (no pair of which differ by more than the shortest significant range for a subset of that size) which consist of the following colleges:

(3, 7, 5, 1, 6, 4, 8)

(5, 1, 6, 4, 8, 2)

TABLE X

ANALYSIS OF VARIANCE OF MATHEMATICS SAT BETWEEN THE EIGHT INDIVIDUAL COMMUNITY COLLEGES AS REPRESENTED BY THEIR STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	12441.333	7	1777.333	0.2223
Within groups	1654719.522	207	7993.814	
Total	1667160.855	215		

F is not significant at the .05 level of confidence.

TABLE XI

MATHEMATICS SAT MEANS BY COMMUNITY COLLEGE
TOTAL POPULATION

N = 215

Community College	Mean	Standard Deviation	Number	Rank of Mean
1	501.65	106.032	49	6
2	491.44	88.293	18	3
3	472.91	57.824	11	1
4	498.33	82.353	39	5
5	502.47	80.709	47	7
6	510.44	90.100	9	8
7	488.81	86.080	21	2
8	498.19	94.497	21	4

There was only one homogeneous subset (no pair of which differ by more than the shortest significant range of a subset of that size) which consists of the following colleges:

(3, 7, 2, 8, 4, 1, 5, 6)

An analysis of variance was also conducted for the converted class rank score and as the data indicate in Table XII, (see page 57), an F ratio of 1.055 with 214 degrees of freedom was obtained and is found to be not significant. Data in Table XIII, (see page 58), indicate the means and standard deviations of the converted class rank with a low of 50.816 (54 %ile) for college 1 and a high of 54.636 (64 %ile) for college 3. Once again only one homogeneous subset occurred with every community college represented. The results of this analysis for the class rank show that there is no significant difference among community colleges in terms of class rank.

Since the analyses of variance for the Verbal SAT, Mathematics SAT, and class rank of students by individual community colleges showed no significant differences among the eight community colleges, the investigator was led to reject hypothesis number two.

Hypothesis 3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of regularly enrolled University students.

In order to determine if a difference in academic aptitude existed between individual community colleges as represented by their students and the regularly enrolled University group, an analysis of variance was conducted for each of the three criteria of Verbal SAT, Mathematics SAT, and class rank. Data in Table XIV, (see page 59), indicate that for the Verbal SAT an F ratio was found of 16.412 with

TABLE XII

ANALYSIS OF VARIANCE OF CONVERTED CLASS RANK BETWEEN THE EIGHT INDIVIDUAL COMMUNITY COLLEGES AS REPRESENTED BY THEIR STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	337.434	7	48.204	1.055
Within groups	9455.402	207	45.678	
Total	9792.837			

F is not significant at the .05 level of confidence.

TABLE XIII

CONVERTED CLASS RANK MEANS BY COMMUNITY COLLEGE
TOTAL POPULATION

N = 215

Community College	Mean	Standard Deviation	Number	Rank of Mean
1	50.816	7.625	49	1
2	51.000	6.444	18	3
3	54.656	7.256	11	8
4	53.282	6.443	39	6
5	53.638	6.305	47	7
6	51.000	5.099	9	2
7	52.238	5.629	21	5
8	51.952	7.690	21	4

There was only one homogeneous subset (no pair of which differ by more than the shortest significant range for a subset of that size) which consists of the following colleges:

(1, 6, 2, 8, 7, 4, 5, 3)

TABLE XIV

ANALYSIS OF VARIANCE OF VERBAL SAT BETWEEN STUDENTS OF INDIVIDUAL COMMUNITY COLLEGES AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	764697.937	8	95587.242	16.412**
Within groups	3092622.393	531	5824.147	
Total	3857320.330	539		

**F is significant at the .01 level of confidence.

539 degrees of freedom. The table of F ratio values shows the F ratio of 16.412 to be significant at the .01 level of confidence. This indicated a significant difference between the Verbal SAT scores of the students of individual community colleges and the scores of the University students, with the community college scores being significantly lower. Data in Table XV, (see page 61), indicate that the mean Verbal SAT of students from each of the individual community colleges is lower than the mean Verbal SAT of the University students. From this computation came three homogeneous subsets. The only college not included in any one of those homogeneous groups was the University of Massachusetts, which indicates that the mean Verbal SAT of regularly enrolled University students is significantly different from the mean Verbal SAT of the community college group.

Data in Table XVI, (see page 62), indicate for the Mathematics SAT an F ratio of 21.868 with 539 degrees of freedom. According to the table of F ratio values, the F ratio of 21.868 is significant at the .01 level of confidence. This analysis indicates that there is a significant difference in Mathematics SAT scores between the students of the individual community colleges and the regularly enrolled University students, with the individual community college students scoring lower than the University students.

The above is further verified by data in Table XVII, (see page 63), The mean Mathematics SAT score of students from the individual community colleges is lower than the mean Mathematics score of

TABLE XV

VERBAL SAT MEANS BY COLLEGE
TOTAL POPULATION

N = 540

College	Mean	Standard Deviation	Number	Rank of Mean
1	482.04	77.892	49	4
2	509.83	95.416	18	8
3	436.91	130.074	11	1
4	492.79	71.877	39	6
5	478.72	85.845	47	3
6	482.56	52.964	9	5
7	443.62	91.753	21	2
8	498.86	68.138	21	7
U. Mass.	554.04	71.544	325	9

There were three homogeneous subsets (no pair of which differ by more than the shortest significant range for a subset of that size) which consist of the following colleges:

(5, 1, 6, 4, 8, 2)

(3, 5, 1, 6, 4, 8)

(3, 7, 5, 1, 6)

TABLE XVI

ANALYSIS OF VARIANCE OF MATHEMATICS SAT BETWEEN STUDENTS OF INDIVIDUAL COMMUNITY COLLEGES AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	1158971.969	8	144871.496	21.868**
Within groups	3517711.695	531	6624.692	
Total	4676683.664	539		

**F is significant at .01 level of confidence.

TABLE XVII

MATHEMATICS SAT MEANS BY COLLEGE
TOTAL POPULATION

N = 540

College	Mean	Standard Deviation	Number	Rank of Mean
1	501.65	106.031	49	6
2	491.44	88.293	18	3
3	472.91	57.824	11	1
4	498.33	82.353	39	5
5	502.47	80.709	47	7
6	510.44	90.100	9	8
7	488 81	86.080	21	2
8	498.19	94.497	21	4
U. Mass.	591.81	75.828	325	9

There was one homogeneous subset (no pair of which differ by more than the shortest significant range for a subset of that size) which is composed of the following colleges:

(3, 7, 2, 8, 4, 1, 5, 6)

regularly enrolled University students. From the rank order of means, one homogeneous subset was formed, composed of all eight of the community colleges, thus indicating that all eight of the community colleges scored lower in Mathematics SAT than regularly enrolled University students.

Data in Table XVIII, (see page 65), indicate for converted class rank an F ratio of 26.139 with 539 degrees of freedom. The F ratio of 26.139 is significant at the .01 level of confidence. This shows that there is a significant difference in converted class rank scores between the students from individual community colleges and regularly enrolled University students.

The above is further verified by the data in Table XIX, (see page 66), which indicates that the class rank means for the students by individual community college are significantly different from the class rank mean of the regular University students, with the University students scoring higher. There was one homogeneous subset, and it was composed only of the eight community colleges.

The investigator was led to accept hypothesis number three since the analyses of variance for the Verbal SAT, Mathematics SAT, and class rank showed significant differences between students by individual community college and the regularly enrolled University students.

TABLE XVIII

ANALYSIS OF VARIANCE OF CONVERTED CLASS RANK SCORES BETWEEN STUDENTS OF INDIVIDUAL COMMUNITY COLLEGES AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	F Ratio
Between groups	9891.483	8	1236.435	26.1393*
Within groups	25117.292	531	47.301	
Total	35008.775	539		

*F is significant at .01 level of confidence.

TABLE XIX

CONVERTED CLASS RANK SCORE MEANS BY COLLEGE
TOTAL POPULATION

N = 540

College	Mean	Standard Deviation	Number	Rank of Mean
1	50.816	7.625	49	1
2	51.000	6.444	18	3
3	54.636	7.256	11	8
4	53.282	6.443	39	6
5	53.638	6.305	47	7
6	51.000	5.099	9	2
7	52.238	5.629	21	5
8	51.952	7.690	21	4
U. Mass.	60.942	6.952	325	9

There was one homogeneous subset (no pair of which differ by more than the shortest significant range for a subset of that size) which consists of the following colleges:

(1, 6, 2, 8, 7, 4, 5, 3)

Section II

This section is concerned with the comparison of the pattern of grades attained in semesters five, six, seven, and eight between community college transfers and regularly enrolled University students. These data and critical analyses are presented in order to test the following hypotheses:

Hypothesis 4. The first semester-after-transfer grade point average for community college transfers will be lower than the fifth semester grade point average for regularly enrolled University students.

In order to determine if a significant difference existed between the first semester-after-transfer grade point average for the community college transfers and the fifth semester grade point average for the regularly enrolled University students, a t-test of significance between means was computed. Data in Table 20, (see page 68), indicate that a t-ratio of 5.62 was obtained. This was significant at the .01 level of confidence. The mean grade point average for the community college transfers was 2.08 while the mean grade point average for the University group was 2.44. The findings of this analysis indicated that the community college students scored significantly lower on grade point average for fifth semester than did the regularly enrolled University students. This led the investigator to accept hypothesis number four.

TABLE XX

MEAN AND T RATIO OF SEMESTER FIVE GRADE POINT AVERAGE FOR COMMUNITY COLLEGE TRANSFERS AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

College Group	Grade Point Average Mean	t ratio
Community College	2.08	5.63**
Regularly Enrolled U. Mass.	2.44	

**t ratio is significant at the .01 level of confidence.

Hypothesis 5. The mean eighth semester grade point average for both groups will be approximately the same.

In order to determine if the semester eight grade point average for the community college group was nearly the same as the regularly enrolled University group, a t-test of significance between means was computed. Data in Table XXI, (see page 70), indicate that a t-ratio of 2.3529 was obtained. This is not significant at the .01 level of confidence. The mean grade point average for the community college transfer student was 2.62, while the mean grade point average for the University group was 2.78. Since the difference in means between the community college students and the regularly enrolled University students was not significant, the investigator was led to accept hypothesis number five.

In order to show the comparison of the academic achievement patterns for semesters five, six, seven, and eight for both the transfers and regularly enrolled University students, the mean grade point averages were plotted. The data in Table XXII, (see page 71), show that the mean grade point average for the transfers is 2.08 and for the regularly enrolled University students 2.44 for semester five. As has already been shown in Table XX the difference in means is significant, with the community college student being lower in achievement. For semester six the respective means for the community college group and the University group are 2.25 and 2.59. Reference to Table 23, (see page 72), shows the t-ratio for the means to be 5.36,

TABLE XXI

MEAN AND T RATIO OF SEMESTER EIGHT GRADE POINT AVERAGE FOR COMMUNITY COLLEGE TRANSFERS AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

College Group	Grade Point Average Mean	t ratio
Community College	2.62	2.35
Regularly Enrolled U. Mass.	2.78	

t ratio is not significant at .01 level of confidence.

TABLE XXII

COMPARISON OF MEAN GRADE POINT AVERAGE BY SEMESTER
BETWEEN COMMUNITY COLLEGE TRANSFERS AND
REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

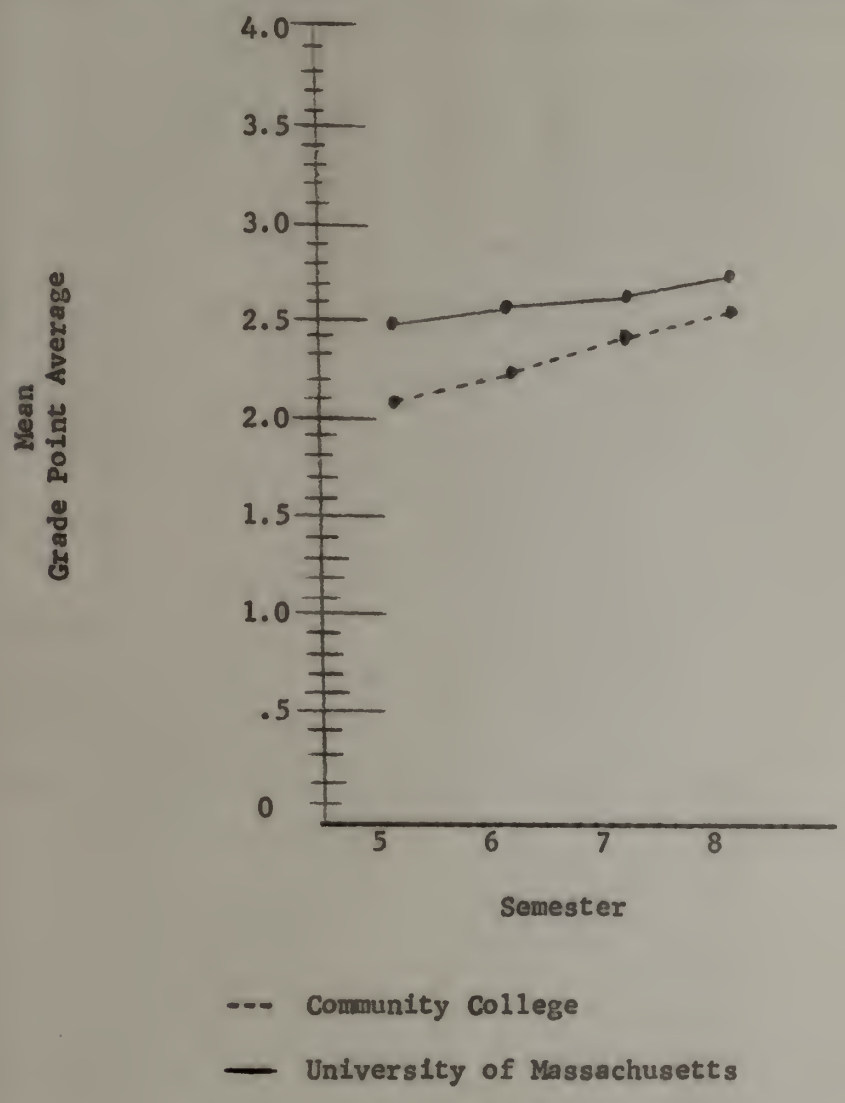

TABLE XXIII

MEAN AND T RATIO OF SEMESTER SIX GRADE POINT AVERAGE FOR COMMUNITY COLLEGE TRANSFERS AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

College Group	Grade Point Average Mean	t ratio
Community College	2.25	5.36**
Regularly Enrolled U. Mass.	2.59	

**t ratio is significant at the .01 level of confidence.

which is significant. For semester seven the respective means were 2.44 for the community college group and 2.69 for the University group. The t-ratio of 3.67 as shown in Table XXIV, (see page 74), is significant indicating that there is a difference in academic achievement for semester seven. The mean grade point average for semester eight for the transfers is 2.62 and for the regularly enrolled University students it is 2.78. As Table XXI, (see page 70), shows this is not a significant difference.

A comparison of the pattern of achievement as measured by semester grade point average between the two groups studied is an interesting one. There is a definite difference for the first semester after transfer for the community college students. Each succeeding semester the difference in the grade point averages between the two groups lessens, until the eighth semester finds the mean averages to be similar.

TABLE XXIV

MEAN AND T RATIO OF SEMESTER SEVEN GRADE POINT AVERAGE FOR COMMUNITY COLLEGE TRANSFERS AND REGULARLY ENROLLED UNIVERSITY OF MASSACHUSETTS STUDENTS

College Group	Grade Point Average Mean	t ratio
Community College	2.44	3.67**
Regularly Enrolled U. Mass.	2.69	

**t ratio is significant at the .01 level of confidence.

Section III

This section is concerned with the four previously defined "types" of community college transfer students, namely the "plugger-type," "late-achiever-type," "unqualified-type," and "qualified-type." The purpose in this section is to determine the relationship of certain academic variables with the academic achievement attained at the University for each type of community college transfer. The variables are: (1) grade twelve Verbal SAT, (2) Mathematics SAT, (3) class rank, and (4) community college grade point average. The criterion is the cumulative grade point average received after four semesters of study after transfer to the University. In order to determine the relationship of these variables with the academic achievement as measured by their University of Massachusetts cumulative grade point averages, a multiple regression technique was employed. Correlation coefficients were computed for each variable for each type of student in order to determine the significance of the relationship of the variable to the academic achievement. It is expected that the findings from these analyses will indicate the predictive value of each of these variables as well as the overall predictive value of the combined variables.

Hypotheses six, seven, eight, and nine will be treated in this section.

Hypothesis 6. For the "plugger-type"-community college student there is a difference between the academic aptitude as measured by the Verbal SAT, Mathematics SAT, class rank, and community college grade point average, and the cumulative grade point average after four semesters of study at the University.

In order to determine the relationship of these variables to the cumulative grade point average attained after four semesters of study at the University for the "plugger-type" transfer, a multiple regression analysis was conducted. Data in Table 25, (see page 77), indicate the correlation coefficients for the academic aptitude variables. The only coefficient that is significant at the .01 level is that of .75855, which is the correlation coefficient for the variable community college grade point average and the University of Massachusetts grade point average. It appears that for the "plugger-type" the only individual variable of the four that has predictor value is that of community college grade point average. This is further evidenced by the data on Table 26, (see page 78), which shows the multiple and partial correlation coefficients. The multiple R for the combined variables of .778 is significant at the .01 level. The only partial correlation coefficient significant at the .01 level for the "plugger" is that of the community college grade point average. The partial correlation coefficient is .654.

Data in Table 27, (see page 79), of the analysis of variance for the multiple regression indicates an F-ratio of 3.8356. This is significant

TABLE XXV

RELATIONSHIP OF ACADEMIC APTITUDE FACTORS TO ACADEMIC ACHIEVEMENT AT THE UNIVERSITY OF MASSACHUSETTS FOR THE PLUGGER-TYPE

Variable	1	2	3	4	Y
1. Verbal SAT		0.00378	-0.12137	0.27424	0.23588
2. Math SAT			-0.18206	-0.33884	-0.39769
3. Class Rank				0.37042	0.34700
4. C.C. G.P.A.					0.75855
Y. U.M. G.P.A.					

TABLE XXVI

MULTIPLE AND PARTIAL CORRELATIONS
FOR THE PLUGGER-TYPE

Variables	Correlation Coefficients
$RYX_1X_2X_3X_4$	.777**
$ryx_1 \cdot x_2x_3x_4$	.098
$ryx_2 \cdot x_1x_3x_4$	-.233
$ryx_3 \cdot x_1x_2x_4$	.118
$ryx_4 \cdot x_1x_2x_3$	.654**

**Correlation coefficient is significant at .01 level of confidence.

TABLE XXVII

ANALYSIS OF VARIANCE FOR THE MULTIPLE REGRESSION FOR THE PLUGGER-TYPE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Due to Regression	4	1.11636	0.27909	3.8356*
Deviation about Regression	10	0.72764	0.07276	
Total	14	1.84400		

*F ratio is significant at the .05 level of confidence.

at the .05 level and indicates that the combination of variables is predictive of academic achievement for the "plugger-type" at the University of Massachusetts.

The findings of the analyses led the investigator to accept hypothesis number six.

Hypothesis 7. For the "late-achiever" type community college student there is a difference between academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank and community college grade point average and the grade point average after four semesters of study at the University.

In order to determine the relationship of these variables to the cumulative grade point average attained after four semesters of study at the University for the "late-achiever" type transfer, a multiple regression analysis was conducted. Data in Table 28 (see page 81) indicate the correlation coefficients for the academic aptitude variables. The only coefficient that is significant at the .01 level is that of .66591, which is the correlation coefficient for the variable community college grade point average and the University of Massachusetts grade point average. It seems that for the "late-achiever" type, the only individual variable that has predictor value is that of community college grade point average. This is further evidenced by the data in Table 29 (see page 82) which gives the multiple and partial correlation coefficient. The multiple R for the combined variables and the University grade point average of .693 is significant at the .01 level.

TABLE XXVIII

RELATIONSHIP OF ACADEMIC APTITUDE FACTORS TO ACADEMIC ACHIEVEMENT AT THE UNIVERSITY OF MASSACHUSETTS FOR THE LATE-ACHIEVER TYPE

Variable	1	2	3	4	Y
1. Verbal SAT		-0.72011	-0.1790	0.18453	0.04759
2. Math SAT			0.11921	-0.16729	-0.06433
3. Class Rank				-0.23143	-0.31315
4. C.C. G.P.A.					0.66591
Y. U.M. G.P.A.					

TABLE XXIX

MULTIPLE AND PARTIAL CORRELATIONS
FOR THE LATE-ACHIEVER TYPE

Variables	Correlation Coefficients
$RYX_1X_2X_3X_4$	.693**
$ryx_1 \cdot x_2x_3x_4$	-.112
$ryx_2 \cdot x_1x_3x_4$	-.020
$ryx_3 \cdot x_1x_2x_4$	-.238
$ryx_4 \cdot x_1x_2x_3$	.650**

**Correlation coefficient is significant at .01 level of confidence.

The only partial correlation coefficient significant at the .01 level for the "late-achiever" is that of the community college grade point average and the University grade point average. The partial correlation coefficient is .650.

Data in Table XXX (see page 84) show the analysis of variance for the multiple regression and indicates an F ratio of 3.2379. This is significant at the .05 level, and indicates that the combination of variables is predictive of academic achievement for the "late-achiever" type transfer at the University of Massachusetts.

The findings of the analyses led the investigator to accept hypothesis number seven.

Hypothesis 8. For the "unqualified-type" community college transfer student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average attained after four semesters of study at the University.

In order to determine the relationship of these variables to the cumulative grade point average attained after four semesters of study at the University, a multiple regression analysis was conducted. Reference to Table XXXI (see page 85) indicates that the only correlation coefficient that is significant at the .01 level is that of .42242, which is the correlation coefficient for community college grade point average and University of Massachusetts grade point average. This is further verified by the data in Table XXXII (see page 86) which gives

TABLE XXX

ANALYSIS OF VARIANCE FOR THE MULTIPLE REGRESSION FOR THE LATE-ACHIEVER TYPE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Due to Regression	4	1.47908	0.36977	3.2379*
Deviation about Regression	14	1.59881	0.11420	
Total	18	3.07789		

*F ratio is significant at the .05 level of confidence.

TABLE XXXI

RELATIONSHIP OF ACADEMIC APTITUDE FACTORS TO ACADEMIC ACHIEVEMENT AT THE UNIVERSITY OF MASSACHUSETTS FOR THE UNQUALIFIED TYPE

Variable	1	2	3	4	Y
1. Verbal SAT		0.31944	-0.30282	0.33193	0.18511
2. Math SAT			-0.29001	0.16152	0.02952
3. Class Rank				-0.04591	0.04420
4. C.C. G.P.A.					0.42246
Y. U.M. G.P.A.					

TABLE XXXII

MULTIPLE AND PARTIAL CORRELATIONS
FOR THE UNQUALIFIED TYPE

Variables	Correlation Coefficients
$RYX_1X_2X_3X_4$	.445**
$ryx_1 \cdot x_2x_3x_4$	.101
$ryx_2 \cdot x_1x_3x_4$	-.113
$ryx_3 \cdot x_1x_2x_4$	.064
$ryx_4\ x_1x_2x_3$	.394**

**Correlation coefficient is significant at the .01 level of confidence.

the multiple and partial correlation coefficients. The multiple R for the combined variables of .445 is significant at the .01 level. The only partial correlation coefficient that is significant at the .01 level is that of .394 for the community college grade point average.

Data in Table XXXIII (see page 88) show the analysis of variance for the multiple regression and indicate an F-ratio of 3.5158. This is significant at the .05 level, and indicates that the combination of variables is predictive of academic achievement for the "unqualified-type" at the University of Massachusetts.

The findings of the analyses led the investigator to accept hypothesis number eight.

Hypothesis 9. For the "qualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

In order to determine the relationship of these variables to the cumulative grade point average attained after four semesters of study at the University, a multiple regression analysis was conducted. Data in Table XXXIV (see page 89) indicates that the only correlation coefficient that is significant at the .05 level is that of .49069, which is the correlation coefficient for high school class rank. The data in Table XXXV (see page 90) gives the multiple and partial correlations for the "qualified-type". The multiple R for the combined

TABLE XXXIII

ANALYSIS OF VARIANCE FOR THE MULTIPLE REGRESSION FOR THE UNQUALIFIED TYPE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Due to Regression	4	2.04101	0.51025	3.5158*
Deviation about Regression	57	8.27254	0.14513	
Total	61	10.31355		

*F ratio is significant at the .05 level of confidence.

TABLE XXXIV

RELATIONSHIP OF ACADEMIC APTITUDE FACTORS TO ACADEMIC ACHIEVEMENT AT THE UNIVERSITY OF MASSACHUSETTS FOR THE QUALIFIED TYPE

Variable	1	2	3	4	Y
1. Verbal SAT		0.24080	-0.22832	0.33369	0.31284
2. Math SAT			-0.21891	-0.26425	-0.13432
3. Class Rank				0.08330	0.49069
4. C.C. G.P.A.					-0.18639
Y. U.M. G.P.A.					

TABLE XXXV

MULTIPLE AND PARTIAL CORRELATIONS FOR THE QUALIFIED TYPE

Variables	Correlation Coefficients
$RYX_1X_2X_3X_4$	.778**
$ryx_1 \cdot x_2x_3x_4$	.660**
$ryx_2 \cdot x_1x_3x_4$	.072
$ryx_3 \cdot x_1x_2x_4$	.708**
$ryx_4 \cdot x_1x_2x_3$	-.540**

**Correlation coefficient is significant at the .01 level of confidence.

variables and University grade point average is .778 and is significant at the .01 level. The partial correlations of .660 for the Verbal SAT, .708 for the high school rank, and a -.540 for the community college grade point average were significant at the .01 level. Only the Mathematics SAT showed no significant correlation with the University grade point average.

Data in Table XXXVI (see page 92) show an F-ratio of 4.6067 which is significant at the .05 level for the multiple regression. This indicates that the combination of variables is predictive of academic achievement at the University for the "qualified-type" community college transfer.

The findings of the analyes led the investigator to reject hypothesis number nine.

TABLE XXXVI

ANALYSIS OF VARIANCE FOR THE MULTIPLE REGRESSION FOR THE QUALIFIED TYPE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio
Due to Regression	4	2.06050	0.51512	4.6067*
Deviation about Regression	12	1.34186	0.11182	
Total	16	3.40236		

*F ratio is significant at the .05 level of confidence.

Discussion of The Data

Following is a discussion of the findings concerning the ten previously stated hypotheses.

Hypothesis 1. The academic aptitude as measured by the grade twelve Verbal SAT, the Mathematics SAT, and class rank for community college transfers will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen.

By means of the analyses for this hypothesis, it was proven that there is a significant difference in academic aptitude as measured by the stated criteria between the community college transfers and the regularly enrolled University students, with the community college transfers scoring lower.

This finding would not come as a great surprise to many people who know the admissions situation at the University of Massachusetts. The standards for freshman admission to the University of Massachusetts are among the highest in the nation for state institutions, and it has one of the highest application-rejection ratios. This is primarily due to the multitude of applications received for the relatively few vacancies. For September 1968, the University undergraduate admissions office received 18,400 freshmen applications for 3,100 vacancies.

The first question that must be answered is why admit community college transfers at all if they have lower academic aptitude? One might reply that state universities do not exist for the sole purpose of educating only those students with the highest academic aptitude.

It should be in existence to provide high quality education for state citizens who can profit from the experience and be academically successful at the same time. It would seem logical that before the door to upper division education be closed to the community college transfer on the basis of lower academic aptitude, one should view this lower academic aptitude in relation to the transfers' ability to perform academically at the upper division level.

If it should be found that they are capable of successful academic performance, this would lead one to question whether or not secondary school criteria are of any importance at all in terms of admissions criteria for community college transfers.

Also, it would be necessary to decide whether the University expects these community college students to perform academically on an even par with the regularly enrolled University students, or should the criterion for success be successful completion of the bachelor degree requirements?

The University knows that each year in recent times it is forced to turn down thousands of students capable of being successful, but who do not present competituve enough qualifications for admission. It is almost a certainty that at least a portion of these matriculate at a community college.

Determining the aptitude differences between the community college transfers and the regularly enrolled is only a portion of the total situation. Many other variables that may affect academic performance should be investigated. These might include such things as age, sex,

post-high school experience prior to community college enrollment, community college curricula followed, subject matter majors, guidance and counseling at the community college and at the University level. Undoubtedly there are many others that should be researched.

Determining the difference in aptitude between the two groups is a starting point or foundation on which to build future knowledge.

Hypothesis 2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following grade twelve criteria: Verbal SAT, Mathematics SAT, and class rank.

Based upon the results of the analyses, this hypothesis was rejected. One might be surprised at this conclusion since the eight community colleges included in this study represent several different geographical locations in the state. This means that these colleges are available to students from varying kinds of communities; from the large urban areas, the wealthy sub-urban communities, the poor mill towns, and rural areas. But it appears that factors other than community characteristics play a more determining role. One could look at the broader educational scene and discover that due to the increasing birth rate and the larger number of high school graduates seeking higher education, there are relatively fewer vacancies than there are candidates. This causes higher and higher admissions standards which in turn means that the mediocre high school graduate must often turn to junior colleges for his start in undergraduate study. Also many students

may have changed from a general to college preparatory program late in their high school career, which undoubtedly means that they may have academic deficiencies necessary to gain admission to four-year institutions. It is also possible that many students who did not score well on the SAT's or who did not achieve well in high school now view the community college as a last chance to prove that they can achieve on a college level.

Another interesting aspect of this finding is the fact that in terms of admission of transfers from community colleges, it seems reasonable to look at the community colleges as a system or a whole rather than as eight different or unique kinds of colleges, particularly in reference to the academic quality of their student bodies. It is only right and natural that each community college has its own unique characteristics, but in terms of those students who are enrolled in transfer programs and who transfer to the University, it can be assumed that they will be similar in nature of academic aptitude no matter from which community college that they may come.

Hypothesis 3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of the regularly enrolled University of Massachusetts students.

As was indicated by hypothesis one, it seemed wise to investigate the difference in academic aptitude between the two groups; it seemed worthwhile to investigate the differences in the aptitude between

community colleges as represented by their respective students; it followed logically that differences might be found between individual community colleges and the University in terms of academic aptitude. It was found that indeed there was a difference between each individual community college and the University, with each community college being lower than the University. This finding appears to lend support for hypothesis one. It seems to infer that all community colleges in the Commonwealth practice an open-door policy in admissions.

Hypothesis 4. The first semester-after-transfer grade point average for community college transfers will be lower than the fifth semester grade point average for regularly enrolled University students.

The results of the analyses for hypotheses four indicated that there was a significant difference in fifth semester grade point average between the community college transfers and the regularly enrolled University students. It seems feasible that there may be many reasons for this. One might state that they aren't capable of doing the same quality work as the regularly enrolled because they don't have as good ability. But this writer believes that this is not a substantial enough answer. There are too many other possible variables that need to be investigated. Since the community college system is so new in this region of the country, it is possible that their facilities, size and quality of faculty, and academic standards for their students may not be on a high enough plane in order to provide for a stronger lower division program of transfer. Of course the problems of adjustment

upon transferring from a small, rather intimate academic setting into a large, and sometimes impersonal academic environment can cause all sorts of difficulty for the new transfer student. Many of these transfers are still undecided as to the subject matter field in which they wish to major, and this creates many problems in the choosing of correct subjects for that first semester. It is also very likely that the University is unable to provide the initial support that these transfers need upon first arrival on campus. The academic advising system appears to be inadequate in that often faculty advisers are disinterested or unaware of the major and University requirements, and thus advise the transfer students poorly. The floor-counselor system at the University should be reviewed in terms of its effectiveness in assisting the adjustment of the transfer.

The normal factors of living away from home for the first time can possibly affect academic performance. This is particularly probable for that student who now has personal freedom not encountered before transfer, but who now is master of his own time. Many of these students may be unable to cope efficiently with this freedom.

This finding, beyond establishing that community college students perform at a lower academic level than regular University students for the fifth semester, has raised questions that need to be researched in more detail in the near future in order to become more knowledgeable and more effective in dealing with the first semester transfer process.

Hypothesis 5. The eighth semester grade point average for both groups will be approximately the same.

According to the results of the analyses for this hypothesis, it was found that the eighth semester grade point average for the transfers approximated the eighth semester grade point average of the regularly enrolled University students. This is a most interesting finding in that it shows that community college students can achieve nearly as well as the regularly enrolled. There may be several reasons for this occurrence. It is likely that some of the transfer students failed out in the first or second semester after transfer thus causing a rise in the cumulative grade point average each succeeding semester. Of course the same principle can be applied to the University group, also. A possibility exists that this improved academic performance, at least in part, might reflect the student's ability to achieve better grades in his own chosen field of specialization. During the first and second semesters after transfer a student must often complete required lower division University courses in which he is deficient. This means that he may not enroll in many courses within his major field until the seventh and eighth semesters.

Table XXII describes the overall pattern of grades from the fifth through the eighth semesters for these transfer students. It indicates that there is a sequential upward trend. It is likely that the self-image of the transfer is a rather confused one when he first enters the University. He may feel at that time an outsider and not really a member of the University of Massachusetts, but in each succeeding

semester he becomes more integrated into the mainstream of University life. He apparently then gains more self-confidence and displays better study skills and self-direction, all of which undoubtedly reflect positively on his academic achievement.

This study has established the typical grade pattern achieved by community college transfers. This would appear to set a good basis for further research as to the distinct characteristics, and reasons for this pattern. Of special importance would be a study of the attrition and graduation ratios over a period of several semesters.

Hypothesis 6. For the "plugger-type" community college transfer student there is a difference between the academic aptitude as measured by the Verbal SAT, Mathematics SAT, class rank, and community college grade point average, and the cumulative grade point average after four semesters of study at the University.

According to the results of the analyses in testing this hypothesis it was found that the combination of aptitude variables was predictive of achievement at the University by the "plugger-type" transfer student. However, the only individual variable that showed predictive power of achievement was the community college grade point average. In other words, it appears that the typical objective criteria for regular admission, namely the Verbal SAT, Mathematics SAT, and high school class rank need not be applied to admission of community college transfers. Yet, in some institutions even within the Commonwealth of Massachusetts

community college graduates are required to re-take the SAT's and score 500 or higher on each section before they would be considered for admission as transfers.

From this finding, it should encourage four-year institutions to consider the "plugger-type" community college transfer student as a likely candidate to succeed after transfer. This type student has demonstrated in at least two previous occasions that he does succeed, for he achieved in high school by ranking in at least the top-third of his class; and he achieved at the community college or he would not have been recommended.

Hypothesis 7. For the "late-achiever" type community college transfer there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

In testing this hypothesis it was found once again that typical secondary school objective criteria most often used in admissions decision making at four-year institutions, namely Verbal SAT, Mathematics SAT, and class rank, either singly or in combination do not have prediction value for achievement for the "late-achiever" transfer to the University of Massachusetts. However, when combined with the community college grade point average, they as a group act as a predictor. For the "late-achiever" it appears the community college performance

serves as an impetus to success after transfer. Four-year institutions should consider the "late-achiever" as a good candidate for future success after transfer.

Hypothesis 8. For the "unqualified-type" community college transfer student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average attained after four semesters of study at the University.

This kind of transfer student is a most interesting one for according to previously defined characteristics, one would expect him not to attain academic success at the upper division level in college. The typical high school criteria predictors have no value either singly or combined in terms of prediction for success after transfer from a community college for the "unqualified-type" student. Once again the power of prediction rests primarily on the community college grade point average.

One of the major roles of the community college is illustrated here in that it provides a chance for higher education to students who in most cases would be denied admission to college based upon high school criteria ordinarily used in college admissions. It provides equal opportunity for all, and the community college system must be commended for this attribute.

Hypothesis 9. For the "qualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank and community college grade point average and the grade point average attained after four semesters of study at the University.

As one might expect, of the four types of transfers considered in this study, the "qualified-type" student's high school criteria meet the typical standards for admission as a freshman at the University. The only individual variable which did not have predictive power was the Mathematics SAT. In those institutions in which a predicted grade point average is utilized, such as is the case at the University of Massachusetts, the Mathematics SAT has virtually no weight in the regression equation. When the "qualified-type" adds his academic success at the community college to his other predictors, success after transfer can be expected.

The findings of hypotheses six through nine bear major importance in the opinion of the writer. It would appear that the University of Massachusetts can expect success from the community college transfers provided they achieve adequately at the community college level despite what their high school criteria might indicate. It seems logical and right to look upon the new community college system as a vital and integral part of public higher education in the Commonwealth of Massachusetts.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND SUGGESTIONS FOR FURTHER STUDY

The purpose of this chapter is to present a summary of the study, conclusions based upon the findings, recommendations, and suggestions for further study.

Summary

Purpose of the study. This was a study to determine certain academic characteristics and patterns of academic success of community college students who transferred to the University of Massachusetts. More directly the purpose of the study was to: (1) compare the academic aptitude as measured by the grade twelve Verbal SAT score, the Mathematics SAT score, and converted class rank score of community college transfers with the academic aptitude of regularly enrolled University students who completed all of their undergraduate study at the University; (2) compare the academic achievement of these community college transfer students with the academic achievement of the regularly enrolled University students; (3) compare academic aptitude with academic achievement of four specifically defined "types" of community college transfer students; and (4) compare the community college academic achievement with the academic achievement that these transfers attained while enrolled at the University of Massachusetts.

In conducting the study the following hypotheses were examined:

1. The academic aptitude as measured by the grade twelve Verbal SAT, the Mathematics SAT, and class rank for community college transfer students will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen.

2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following grade twelve criteria: Verbal SAT, Mathematics SAT, and class rank.

3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of regularly enrolled University of Massachusetts students.

4. The first-semester-after-transfer grade point average for community college transfers will be lower than the fifth semester grade point average of regularly enrolled University students.

5. The eighth semester grade point average for both groups will be approximately the same.

6. For the "plugger-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

7. For the "late-achiever type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

8. For the "unqualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

9. For the "qualified-type" community college student there is a difference between the academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

Design of the study. The following steps were followed in testing the hypotheses:

Selection and characteristics of the sample population. In order to accomplish the purpose of the study as indicated in Chapter I, the community college sample population consisted of all 239 community college students who were admitted and enrolled in the University in September, 1966. These students were admitted as sophomores or juniors depending upon the number of credits granted them from their junior college study. Eight of the state supported community colleges were represented in the study.

The comparison group consisted of 348 students of the original 2592 who were enrolled as freshmen at the University of Massachusetts in September of 1964 as members of the class of 1968. Only those students of the original freshman class who were still in good standing as juniors in September of 1966 were chosen for the sample group.

The criteria used to determine scholastic aptitude were the grade twelve Verbal SAT score, Mathematics SAT score, and converted class rank score. The criteria used to determine academic achievement were semester and cumulative grade point averages. Statistical analyses of these data were conducted in order to determine the significance of the differences in academic aptitude and academic achievement between groups in the study.

Collection of the data. The cooperation of University and community college officials was secured in order to obtain the data necessary to conduct the study. Data pertaining to semester and cumulative grade point averages for the community college group were obtained from a review of transcripts found in the admissions folder and provided by the community college registrars. Reference to the admissions folders of these transfers was also necessary in order to obtain their academic aptitude criteria which were located on the secondary school transcript. For the regularly enrolled University students, data was obtained from the permanent record folders found in the University of Massachusetts Registrar's Office. The main data for the University group consisted of high school academic aptitude and semester and cumulative grade point averages attained at the University. All raw data was keypunched on International Business Machine cards. The main data bank consisted of a print out of all data for quick and easy reference, and the decks of cards were used for computation purposes at the University Computer Center.

Method of analyzing the data.

Three methods were used in testing the hypotheses posed in Chapter I. The analysis of variance technique was used in order to provide an efficient test of the significance of the differences between two or more groups simultaneously. The t-test was used as a manner of testing the significance of differences among means. Multiple regression was employed as a technique to predict one

characteristic of individuals from one or more other characteristics.

Results of the Analysis of Data

The results of the analysis of data follow in sequential order the hypotheses posed in Chapter I.

Findings pertaining to hypothesis 1. The academic aptitude as measured by the grade twelve Verbal SAT, Mathematics SAT, and class rank for community college transfer students will be lower than for regularly enrolled University of Massachusetts students who entered as freshmen. The mean Verbal SAT for the community college transfer students was 481.20 with an 84.06 standard deviation while the regularly enrolled University students Verbal SAT had a mean Verbal SAT of 554.04 with a 71.54 standard deviation. The F-ratio obtained for these two groups was 116.495 with 539 degrees of freedom. This is significant at the .01 level of confidence.

Concerning the Mathematics SAT difference between the two groups, the community college transfer group had a mean of 497.68 with a standard deviation of 88.26 while the University group had a mean of 591.81 with a standard deviation of 75.83. The F-ratio for the analysis of this difference was 174.732 with 539 degrees of freedom. This is significant at the .01 level of confidence.

The mean converted class rank score for the community college transfer group was 52.349 (56%ile) with a standard deviation of 6.765, and the mean for the University group was 60.942 (85%ile) with

a standard deviation of 6.953. The analysis of variance results indicated an F-ratio of 201.90. This is significant at the .01 level.

Findings pertaining to hypothesis number one indicate that there is a significant difference in academic aptitude between the two groups, with the community college transfers being lower than the University students who completed all their undergraduate work at the University.

Findings pertaining to hypothesis 2. Individual community colleges will vary significantly on scores of academic aptitude as measured by their students' scores on the following criteria: Verbal SAT, Mathematics SAT, and class rank. The Verbal SAT means among the community colleges ranged from a low of 436.91 for college 3 to a high of 509.83. The F-ratio of 1.610 with 214 degrees of freedom is not significant. The results of the findings of this analysis indicated that there is no significant difference in Verbal SAT scores among the individual community colleges.

The Mathematics SAT means ranged from a low of 472.91 for college 3 to a high of 510.44 for college 6. The F-ratio of .2223 with 214 degrees of freedom is not significant at the .01 level. The results of the findings of this analysis indicate that there is no significant difference in Mathematics SAT scores among the community colleges.

The mean converted class rank score ranged from a low of 50.816 (54%ile) for college 1 to a high of 54.636 (64%ile) for college 3. An F-ratio of 1.055 with 214 degrees of freedom was established. This F-ratio is not significant at the .01 level. This indicated that

there was no significant difference in converted class rank score among the community colleges.

Findings pertaining to hypothesis number two indicate that there is no significant difference in academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank among the eight community colleges.

Findings pertaining to hypothesis 3. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank of students by individual community college will be lower than the academic aptitude of regularly enrolled University students. An F-ratio of 16.412 with 539 degrees of freedom was established for the variance between Verbal SAT of the transfer group and the Verbal SAT of the regularly enrolled University group. The F-ratio is significant at the .01 level of confidence. This indicated that there was a significant difference in Verbal SAT between the individual community colleges and the regularly enrolled University students, with the individual community colleges scoring lower.

An F-ratio of 21.868 with 539 degrees of freedom was established for the variance between individual community colleges and the University group for the Mathematics SAT. This is significant at the .01 level and indicates that there is a difference in Mathematics SAT between the individual community colleges and the regular enrolled University group, with the individual community colleges being lower.

For the converted class rank variance, an F-ratio of 26.139 with

539 degrees of freedom was established, and is significant at the .01 level. This indicates that there is a difference in converted class rank score between individual community colleges and the University group, with the community colleges being lower.

Findings pertaining to hypothesis number three indicate that there are significant differences in academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank between individual community colleges as represented by their respective students and the regularly enrolled University students, with the individual community college students being lower.

Findings pertaining to hypothesis 4. The first-semester-after-transfer grade point average for community college transfers will be lower than the fifth semester grade point average for regularly enrolled University students. The mean grade point average for the community college transfers for the first-semester-after-transfer was 2.08 while the mean grade point average for the fifth semester for the University group was 2.44. A t-ratio of 5.63 was obtained, and this is significant at the .01 level of confidence. The findings of this analysis indicated that there was a significant difference in mean grade point averages for semester five between the two groups with the community college group scoring lower.

Findings pertaining to hypothesis 5. The mean eighth semester grade point average for both groups will be approximately the same.

The mean grade point average for community college transfer students for semester eight was 2.62, and for the regularly enrolled University students the mean was 2.78. A t-ratio of 2.35 was established, and this is not significant at the .01 level.

Findings pertaining to hypothesis number five indicate that there is no significant difference for semester eight between the community college transfers and the regularly enrolled University students.

The mean grade point average for semester six was 2.25 for community college transfers and 2.59 for the regularly enrolled group. For semester seven the mean grade point average was 2.44 and 2.59 respectively. T-ratios for both semesters six, 5.36, and semester seven, 3.67, indicate significance at the .01 level. The general pattern of mean grades from semester five to semester eight indicates a trend from marked difference in semester five to similarity in semester eight between the two groups.

Findings pertaining to hypothesis 6. For the "plugger-type" community college transfer student there is a difference between the academic aptitude as measured by the grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the cumulative grade point average after four semesters of study at the University.

Correlation coefficients were established for the four academic aptitude variables for the "plugger-type" transfer student. Singly, the only variable that correlates significantly at the .01 level with

University grade point average is the community college grade point average. The correlation coefficient was .779. This is further evidenced by the multiple R of .778 for the combined variables. The only partial correlation coefficient that is significant at the .01 level is that one for community college grade point average with a coefficient of .654. The analysis of variance for the multiple regression indicates an F-ratio of 3.8356. This is significant at the .05 level. The mean cumulative grade point averages were 2.9 for the plugger while in community college and 2.6 for his study while at the University.

Findings pertaining to hypothesis number six indicate that the combination of variables, with the community college grade point average having the most power, is predictive of academic achievement at the University for the plugger-type community college transfer.

Findings pertaining to hypothesis 7. For the "late-achiever" type community college transfer student there is a difference between academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average after four semesters of study at the University.

Correlation coefficients were established for the four academic aptitude variables and University grade point average. The correlation coefficient of .666 for community college grade point average was the only one significant at the .01 level of confidence. However, a multiple R of .693 for the combined variables and University grade point

average was established and is significant at the .01 level. The only partial correlation coefficient that was significant at the .01 level was that of .650 for the community college grade point average. An analysis of variance for the multiple regression indicates an F-ratio of 3.2379. This is significant at the .05 level. The mean cumulative grade point averages for the late-achiever were 2.8 at the community college and 2.3 at the University.

Findings pertaining to hypothesis number seven indicate that the combination of academic aptitude variables, with the community college grade point average having the most power, is predictive of academic achievement at the University for the late-achiever community college transfer.

Findings pertaining to hypothesis 8. For the "unqualified-type" community college transfer student, there is a difference between academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank and community college grade point average and the grade point average attained after four semesters of study at the University.

Correlation coefficients were established for the four academic aptitude variables and University grade point average for the "unqualified-type" transfer. The correlation coefficient of .422 for community college grade point average and University grade point average was the only one significant at the .01 level. However, a multiple R of .445 for the combined variables and University average is significant at the .01 level. The only partial correlation coefficient

significant at the .01 level was that of .394 for the community college grade point average and University average. An analysis of variance of the multiple regression indicated an F-ratio of 3.5158. This is significant at the .05 level. The mean cumulative grade point averages for the unqualified-type were 2.7 at the community college and 2.3 at the University.

Findings pertaining to hypothesis number eight indicate that the combination of academic aptitude variables, with the community college grade point average having the most power, is predictive of academic achievement for the unqualified-type community college transfer.

Findings pertaining to hypothesis 9. For the "qualified-type" community college transfer student there is a difference between academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, class rank, and community college grade point average and the grade point average attained after four semesters of study at the University.

Correlation coefficients were established for the four academic aptitude variables and University grade point average. The only coefficient significant at the .05 level was class rank. However, a multiple R for the combined variables and University grade point average of .778 was established. This is significant at the .01 level of confidence. The partial correlations of .660 for the Verbal SAT, .708 for the high school rank, and -.540 for the community college grade point average were significant at the .01 level. Only the Mathematics SAT showed no significant correlation with the University

grade point average. An analysis of variance of the multiple regression indicates an F-ratio of 4.6067 which is significant at the .05 level. The mean grade point averages for the qualified-type transfer were 2.8 at the community college and 2.4 at the University.

Findings pertaining to hypothesis number nine indicate that the combination of academic variables are predictive of achievement for the qualified-type community college transfer student at the University, with all having power except Mathematics SAT.

Conclusions

The following are major conclusions which appear to be valid within the limitations of this investigation for the community college transfer students who entered the University of Massachusetts in September, 1966.

1. The academic aptitude as measured by grade twelve Verbal SAT, Mathematics SAT, and class rank for community college transfer students was lower than the academic aptitude of regularly enrolled University students who completed all their undergraduate study at the University.

2. There is no significant difference between individual community colleges as pertains to the academic aptitude of their students who enrolled as transfers at the University.

3. The community college transfers ranked significantly below the academic achievement level of the regularly enrolled University student for the first semester after transfer.

4. There is no significant difference in academic achievement

between community college transfers and the regularly enrolled University students four semesters after transfer.

5. Academic achievement at the community college level is the best predictor of successful academic achievement at the University of Massachusetts. High school criteria are quite irrelevant in terms of predicting success after transfer. The "plugger-type" community college transfer student is a better academic risk than the "late-achiever," the "unqualified," or even the "qualified-type," although all four types are good transfer candidates if they achieved well at the community college.

6. Community college transfer students received preparation at the two-year college level that enabled them to succeed academically at the University of Massachusetts.

Recommendations

The following recommendations are made as a result of this study:

1. The University of Massachusetts should expand admissions to community college transfer students in the years just ahead.

2. The public community college system should be expanded.

3. Community colleges should be viewed as a system rather than as separate kinds of colleges, particularly with reference to admission of transfer students.

4. A position of "Community College Coordinator" should be established at the University. This person should be responsible for developing a more efficient program of articulation for the two-year

college transfer students.

5. There should be an on-going evaluation of the transfer process of junior college transfers.

6. Articulation between the community colleges and the University should be further developed.

Suggestions for Further Study

This study has raised some intriguing questions. The following are suggestions for further study:

1. Studies of the process of social and emotional adjustment of the two-year college transfer are needed.

2. Studies of the effectiveness of student personnel services for transfers at both the community college level and the University level are needed in order to learn how to deal more effertively with the transfer student and the transfer process in general.

3. Other senior level colleges should conduct research studies similar to this one in order to find out more about the students who transfer to their respective colleges or universities.

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